1. (8 pts, 4 each) Give the IUPAC name of the following compounds.

a) [Diagram of a compound with labels and functional groups]
   - 1-ethyl-3,4,6-trimethylcyclohexane

b) [Diagram of a compound with labels and functional groups]
   - 4-(3-ethyl-1-hexyl)-2-isopropylcyclohexane

2. (8 pts) a) For the following molecules, draw the Newman projection of the lowest potential energy conformation sighting down the indicated bond. B) On the Newman projection for ii, label the methyl groups attached to C2 as anti or gauche.

   i) BrCH₂CH₂Br (sighting down the C1-C2 bond)
   ii) 2-methylpentane (sighting down C2-C3 bond)

3. (4 pts, 2 each) What is the relationship between the following pairs of molecules? (constitutional isomers, different molecular formula, conformers, configurational stereoisomers)

   a) [Diagrams of two Newman projections]
      - Conformers

   b) [Diagrams of two Newman projections]
      - Constitutional isomers
      (Constitutional = structural) (also structural)
4. (1 pt) How many equivalent sets of hydrogen atoms are there in the following molecule? 

![Molecule Diagram]

5. (4 pts) Draw the following molecule in its lowest potential energy chair conformation. (Draw all hydrogen atoms and the alkyl group substituents).

![Molecule Diagram]

Numerous ways to draw the lowest P.E. chair form correctly—but in all correct cases, the butyl and 1-methyl groups must be equatorial.